Understanding the Mysteries of Fluorination in Medicinal Chemistry

Overview

Fluorination of a drug candidate affects physicochemical properties, which in medicinal settings perturbs pharmacodynamic, pharmacokinetic, distribution, and/or metabolic profiles both in vitro and in vivo. Due to these F-induced perturbations, historically, ~30% of FDA approved therapeutics, and more recently (2018–2020) ~40% of small molecule approvals bear at least one or more fluorine atom. Thus, the ability to selectively install fluorinated groups under mild conditions is essential for accessing new therapeutics and biological probes. In fact, nearly every drug discovery campaign in major pharmaceutical companies undergoes a stage of development in which medicinal chemists will exploit fluorination to improve dug distribution metabolism and pharmacokinetic properties of the lead compound. While the value of fluorination in medicinal chemistry and drug development cannot be understated, few individuals understand the physical basis for why fluorine and fluorinated functional groups perturb pharmacodynamic, pharmacokinetic, distribution, and/or metabolic profiles of ligands. The proposed short course will explain the physicochemical basis for why fluorination is important in medicinal chemistry and drug discovery. Starting from simple principles of physical organic chemistry, students will be led to understand the basis for how fluorination perturbs physical properties of functional groups and ligands, and how these physiochemical perturbations influence how small molecule therapeutics behave in the body.

Course Duration	**November 03-07, 2025 (5 days, 15 hours of lectures and 10 hours of tutorials)**
Modules	1. Physical Principles, Stability, Reactivity Patterns of Fluorine and Fluorinated Groups 2. Controlling Molecular Conformations Using Fluorine and Fluorinated Substituents 3. Structural Diversity of Bioactive Fluorinated Organic Small Molecules 4. Reagents for the fluorination chemistry 5. Metal catalyzed fluorination reactions and late-stage functionalization 6. Characterization of Fluorinated Organic Small Molecules 7. Regulatory issues with perfluorinated compounds, and substructures **Number of participants for the course will be limited to fifty.**
You Should Attend If…	• Students at all levels (B.Sc./M.Sc./M.Pharma/Ph.D) • Faculty from reputed academic institutions and technical institutions. • Corporate Executives from private and government organizations.
Fees	The participation fees for taking the course are as follows: **Participants from abroad: US $100** **Participants from Industry: INR 2,500** **Participants from Academic Institutions (faculty/scientific staff): INR 1,500** **Students: INR 1,000** The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, and an internet facility.

The Faculty

Prof. Ryan A. Altman received a BSChem from Creighton University and a PhD in organic chemistry from MIT with Professor Stephen Buchwald. After completing postdoctoral studies with Professor Larry Overman at UC Irvine, he joined the Department of Medicinal Chemistry at The University of Kansas. In 2020, he moved to Purdue University to join both the Borch Department of Medicinal Chemistry and Molecular Pharmacology and the Tarpo Jr. Department of Chemistry, where he is currently a Full Professor and the Steve and Lee Ann Taglienti Chair of Pharmacy. The Altman group works at the interface of synthetic organic and medicinal chemistries, with synthetic emphases in the areas of organometallic and organofluorine transformations and unique chemical reactivities enabled by fluorinated substructures and with collaborative medicinal interests spanning a range of disease states, including pain, anxiety, mood disorders and aging.

Dr. Deepak B. Salunke received his PhD at the Organic Chemistry Division of CSIR-National Chemical Laboratory (NCL), Pune and was also awarded Indo-French Sandwich Thesis Scholarship to work at the ICSN-CNRS France. Dr. Salunke is an editorial advisory board member of the ACS-Journal of Medicinal Chemistry and worked at the Advinus Therapeutics Pvt. Ltd., SAI Life Sciences Ltd. As well as at the Higuch Biosciences Centre of the University of Kansas, USA and Department of Applied Chemistry of the National Chiao Tung University, Taiwan. Dr. Deepak Salunke is engaged in research involving design, synthesis and Structure-Activity Relationships (SAR) of novel pharmaceutically interesting scaffolds. Combinatorial parallel synthesis as well as diversity-oriented synthesis of organic small molecules and to develop innovative methodologies for important organic transformations.

Dr. Madhuri Tanaji Patil completed her education from the Savitribai Phule Pune University Formerly University of Pune, Pune, India. She worked as a research fellow at the CSIR-National Chemical Laboratory, Pune, India, and got her Ph.D. in the year 2013. She also worked as a post-doctoral researcher at the Department of Pharmaceutical Chemistry, University of Kansas, Lawrence, USA and as Assistant Professor at the Dr. D. Y. Patil Institute of Engineering and Technology, Pune. Dr. Patil is currently faculty at the Post Graduate Department of Chemistry, Mehr Chand Mahajan DAV College for Women, Chandigarh. Dr. Patil is also a recipient of the Women Scientist Fellowship of the Department of Science and Technology (DST WOSA), Govt. of India. Her research interest is in the field of inositol-based surfactants and heterocyclic chemistry.

To register Click here: https://forms.gle/L88ABWbJ8tjSFBZf6

Registration Fee Payment Details:
Bank Account Details for Fee Payment:
Name-Local Coordinator GIAN (Prof. Gurjaspreet Singh)
SBI Acc No. 41435937793
IFSC- SBIN0000742
Branch- Sector-14, Panjab University Chandigarh

Course Co-ordinators

Dr. Deepak B. Salunke
+91-8195968252
salunke@pu.ac.in

Dr. Madhuri Tanaji Patil
+91-8195968251
madhuritanajipatil@gmail.com